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THE TRUNK LINE RATE SYSTEM: A DISTANCE
TARIFF.

THE trunk line freight rate system effectively demonstrates certain principles in railway economics which are of importance at the present time in connection with the problem of Federal regulation. The danger of arbitrary administrative interference without a full understanding of the intricacies of rate making, and at the same time the essential soundness of American railway practice in seeking independently to solve these complex problems by equitable means, are amply illustrated. The fallacy of certain objections to governmental control is revealed with corresponding clearness. Three principles in particular deserve mention in this connection. These are: (1) that the element of distance should be a prime factor in the final adjustment

¹ The author is indebted to the Carnegie Institution for a grant which has made it possible to collect the data for this article in the field, in connection with research on the Economic History of the United States.

of rates as between competing localities; (2) that co-operation and agreement between competing carriers are essential to any comprehensively fair system; and (3) that permanency and stability of rates are of equal importance with elasticity. That all three of these results have been voluntarily worked out in practice by the trunk lines is a tribute at once to the ability and fairness of their traffic officials. Standards are thus established toward which the carriers in the West and South should strive, as soon as their local traffic conditions will permit, in an endeavor to promote good relations with the shipping and consuming public.

That distance tariffs, modified in part to suit commercial conditions, are not only theoretically sound, but entirely practicable, this study aims to prove. The bogey of German rate schedules vanishes into thin air when it appears that the greatest railway companies in the United States have for years adopted the same principles in working out their tariffs. The long and short haul rule is here enforced, not alone as between various points on the *same* line, but also as between points equally distant from a common destination on *different* roads. Thirty years ago the trunk lines conceded the principle, for the recognition of which the shippers of the West and South are now so vociferously clamoring before Congress and the Federal courts.

This desirable end could never have been attained if the several competing companies had not been able to act in co-operation. The erroneous popular opinion that railway competition must be preserved in the public interest, had it been legally enforced in this territory a generation ago, would have prevented absolutely any comprehensive solution of the problem. Until Congress abandons this theory, and treats railways as essentially monopolistic, thereafter to be protected and maintained

as *beneficent* monopolies through adequate governmental supervision, the lesson of trunk line experience will not have been learned. And, finally, the interesting fact that for almost thirty years it has not been necessary to change either the main system or, in many instances, the actual rates charged thereunder, is an offset to the contention that success in railway operation is to be judged by the instability of rates, seeking to follow constantly the ups and downs of commercial conditions. Certain modifications, especially in export and import traffic, or wherever water rates have to be made or met, are, of course, inevitable. But it is absurd to reason from this that railway tariffs in the main need to be continually jostled about at the behest of the shipping public. Of course, if one railway changes its rates, all the rest must follow. That is the principal reason why many of our rate schedules have been as uncertain as the weather. But there is no reason why, if all parties in competition keep good faith and observe their tariffs, a schedule of class rates for domestic shipments should not remain practically constant.

Take the rates on raw cotton from Mississippi River points like Memphis to New England cities, for example. Was any staple product ever subject to greater fluctuations in price than raw cotton, varying as it has in the last few years, from five to fifteen cents a pound? Yet through it all, good years and bad, whether for the planter or the manufacturer, the freight rate has stood unchanged at 55 cents per hundred weight. In the same way, within the limits hereafter to be described, the trunk line rate system has endured for a generation. Founded upon sound and, consequently, defensible principles, it has promoted good feeling between railway and shipper. And, if the changes of classification since 1900 had not been made, one may reasonably doubt whether the demand for Federal legislation would have been any more insistent

throughout the Eastern Central States than it now is in New England.

The causes leading to the adoption of a systematic rate scheme by the trunk lines acting jointly¹ can be understood only in the light of the conditions existing about 1875. The Baltimore & Ohio Railroad had entered Chicago in 1874, after which time the most furious rate wars between

¹ The literature on the subject is scanty. Much of the material has necessarily been gathered in the field by conference with traffic officials and others. My hearty thanks are due primarily to Paul P. Rainer, Esq., chief of the Joint Rate Inspection Bureau at Chicago, for his willingness to impart such explanation of this complicated matter as the delicate responsibilities of his important post permit. The map published herewith, while in part prepared from the actual percentage tables, with his permission and that of several important trunk line officials concerned, has been checked and corrected by his official copyrighted map of January 1, 1899. While the scheme of graphic representation is entirely different, the facts represented are the same. I am also especially indebted to H. C. Barlow, Esq., formerly president of the Terre Haute & Evansville Railroad and now director of the Chicago Commercial Association, and to J. W. Midgley, Esq., for many years one of the Trunk Line Commissioners, for assistance in many ways.

The principal references consulted are included in the following list:—

1874. Windom Committee Report, officially known as Report of the Select Committee on Transportation Routes to the Seaboard, 43d Congress, 1st Session, Senate Report No. 307, vol. i. pp. 24-30; vol. ii. pp. 7, 80, 283.
1879. Hepburn Committee Report, New York State, Special Committee on Railroads, 8 vols., pp. 3001-3006, 3102-3111.
1886. Cullom Committee Report, 49th Congress, 1st Session, Senate Report No. 46, vol. ii. p. 101.
1887. Typewritten Record, Opinion, etc., of the Interstate Commerce Commission in *Detroit Board of Trade v. Grand Trunk, etc., Railways*. Also the Toledo case (1889) and that of Pratt Lumber Company (1905), I. C. C. Reports, vol. ii. p. 315; vol. v. p. 166; and vol. x. p. 29.
1890. Senate Report on the Transportation Interests of the United States and Canada, 51st Congress, 1st Session, Senate Report No. 847, pp. 497, 611-636.
1892. Cincinnati Freight Bureau Case. Copy of Record before the Interstate Commerce Commission, etc., United States Circuit Court for Southern District of Ohio, In Equity No. 4748, vol. i. pp. 42-53. (Reprint.)
1900. Report of United States Industrial commission, vol. iv. pp. 556-562.
1905. Elkins Committee, officially known as Hearings before the Committee on Interstate Commerce, United States Senate, 5 vols., vol. ii. p. 1569, and vol. iii. p. 2271.
1905. Record of Proceedings before the Illinois Railroad and Warehouse Commission in the Matter of Revision of the Schedule of Reasonable Maximum Rates, etc., Springfield, especially pp. 31 *et seq.* (Reprint.)
- 1876-1905. Proceedings and Circulars, Joint Executive Committee and Joint Rate Committee of the Trunk Line, etc., Associations.

the four trunk lines had been in progress. The main dependence of all these lines was still upon the grain traffic, and all of this was moving in one direction toward the seaboard. As late as 1882, 73 per cent. of the trunk line tonnage east-bound consisted of such commodities.¹ Moreover,—and this is a point of especial importance,—the bulk of this grain originated in the territory east of the Mississippi and south of Chicago. Over four-fifths of the east-bound traffic came from the States of Illinois, Indiana, Ohio, Michigan, and Pennsylvania. The great north-west and trans-Mississippi territory was not yet opened up. Wisconsin and Iowa contributed only about 10 per cent. of the east-bound tonnage, while over two-thirds of the west-bound business did not pass beyond Illinois.² Nor was the traffic concentrated as yet in the larger cities. Mr. Fink makes it clear that most of the business was gathered up by the trunk lines and their connections from small towns along the way. The modern problem of the great city in competition with the small towns was as yet unknown. The trunk lines had few feeders. Only the main stems to Chicago had been built. Consequently these Central States were served by a host of little cross lines, built as local enterprises, many of them radiating from Chicago, Cincinnati, Toledo, or Cleveland at right angles with the trunk lines, and, for the main part, engaged in an endeavor to open up their territories to water communication with the East by way of the lakes and the Erie Canal. Rail rates, nominally at least, were still high, the rate first-class Chicago to New York, for example, being about double its present figure; and the conditions of railway operation were such that water competition was a matter for grave concern. Every change in the lake situation was at once reflected in the rail rates, violent

¹ Fink, *Adjustment of Railroad Transportation Rates*, etc., p. 16.

² *Ibid.* pp. 19 and 52.

dislocations at the opening and closing of navigation in the spring and fall being of especial importance.

Among these confusing elements in the problem of trunk line rate adjustment five distinct phases were prominent. In the first place the four trunk lines were a unit in opposition to the diversion of traffic to the Great Lakes and the Erie Canal. However much they might bicker with one another afterward,—apportionment of the rail business being a distinct feature of the problem,—their interests at the outset were identical respecting the necessity of holding the business on land. Water competition by way of the lakes or the Ohio River was a danger common to them all. The intensity of this pressure may be understood from the statement that the trunk lines were not even consulted in making the Chicago-New York rate on which the Western lines pro-rated. They had no voice in it, merely accepting the figure offered them by their connections into Chicago.¹ The second feature of the problem, namely the division of the all-rail traffic among the competing carriers is immaterial to the main question before us. Thirdly, it was essential to the trunk lines to restrict and control the activities of the subsidiary cross lines and feeders, most of which, as has been said, were independent. Many of these, aside from having a direct interest in their longest haul to a terminus on the lakes or the Ohio River, had been built by local capital, and were administered in the interests of the lake cities or Cincinnati and Louisville. There was no unity whatever in their policies, and the most ridiculous wastes of transportation resulted. Grain was literally meandering toward the East instead of moving by a direct route.² Joint through rates would be made by the most extraordi-

¹ Windom Committee Report, vol. ii. p. 7.

² Waste of transportation as an economic problem, will be discussed in another paper.

nary chain of connecting links leading to the seaboard by very circuitous ways.¹

A fourth evil, akin to this, consisted of the difficulty of maintaining through rates, not as among the trunk lines who might be made parties to a pool, but by reason of cut-throat competition between their Western connections.² The agents of these Western lines would indiscriminately cut rates to or from points on their lines, and then expect their trunk line connections to accept a proportionate shrinkage of the joint through rate for their part of the haul. The weaker companies would, of course, be susceptible to such temptations in order to secure the business. No stable apportionment of this Western traffic among the Eastern lines would be possible until they could agree upon a fair rate for the trunk line haul, and rigidly adhere to it. And, finally, water competition, causing constant fluctuations in the lake and Ohio River rates, while directly potent only at waterway points, was continually putting the through rates from these points out of line with the local rates from non-competitive inland centres. Or, perhaps, the Ohio River and lake rates would be out of joint with one another. The Chicago basis, if applied to Paducah, would make a rate on tobacco that would send it via New Orleans.³ Products would go down the Mississippi after the lakes had been closed by ice. A considerable amount of corn was certainly moved to New York by that route.⁴ Some device for co-ordination of the through and local rates—or, as one might put it, for the distribution of the localized shock of water rate changes—was imperatively necessary.

¹ This persisted even in 1890. Consult 51st Congress, 1st Session, Senate Report No. 847, p. 616.

² Hepburn Committee, pp. 3006-3010.

³ Hepburn Committee Report, p. 318.

⁴ Windom Committee Report, vol. ii. p. 287.

An ingenious rate clerk named McGraham, in the offices of the Pennsylvania Railroad, proposed in 1876 a comprehensive scheme for meeting these difficulties. The Chicago-New York rate was to constitute a basis, upon which all other rates were to be made in percentages, according to their relative distance from New York.¹ Thus, assuming Chicago to be 900 odd miles from New York, the rate from a point 600 miles inland would be about $66\frac{2}{3}$ per cent. of the Chicago rate, whatever that might be. Whenever the lake rate at Chicago changed, every other rate throughout trunk line territory would vary in due proportion. Relativity of charges would thus be preserved. Moreover, the shortest route, "worked or workable," was to be used in calculating the rates, the basic distance being about 920 miles by the Lake Shore from Chicago to Dunkirk, Ohio, and thence by the Erie to New York. This would give compelling effect to distance as a factor, and would tend to penalize the roundabout carriage of goods. More than this, however, it would render the inland territory directly tributary to New York. From a point, for example, 50 or 100 miles south of Chicago, Toledo, or Cleveland, the local rate into those towns plus the through rate east to New York would always exceed the rate by a direct route east. For the hypotenuse of a triangle is clearly always shorter than the sum of the other sides. All shipping points equidistant from New York would enjoy equal rates, those rates at any time being determined by the state of water competition. This was a manifest advantage to the small inland centres, while the rate on the lake front was not affected. The trunk lines lost something, perhaps, through lower rates at intermediate points; but the gain through diversion of traffic from the lake to the rail lines more than compensated. For conditions were such in the summer of 1875 that

¹ This was adopted officially by the trunk lines April 13, 1876.

the lake boats were prepared to carry grain for almost nothing. The railroads were helpless in such cases.¹ The only real sufferers were the short, independent cross lines and the lake and river cities. Of these, the former were reduced to a status of mere feeders or branches of the trunk lines. They were compelled to accede to the plan, however, by threatened refusal of the trunk lines to turn over business to them west-bound, unless they reciprocated with their grain shipments east-bound.² Many of these lines became bankrupt later, and were absorbed by the larger companies.³ And, as for the cities unfavorably affected, the scheme based upon distance was so obviously fair that their protests were of no avail.⁴

The great contest between the trunk lines over the granting of differentials to Philadelphia and Baltimore, as against New York and Boston, played a not unimportant part in the diplomacy leading to the acceptance of the McGraham system. The New York Central, the Lake Shore, and the Boston & Albany roads, of course, eagerly accepted it, because it promised aid in meeting the lake competition to which they were peculiarly exposed. The Pennsylvania and the Erie, lying considerably further from Lake Erie, would also be benefited, operating as they did in a territory naturally tributary to them, but exposed to drainage to the lakes by lateral lines. But the Baltimore & Ohio, ever since its entry into Chicago in 1874, had been a thorn in the flesh of the others. The

¹ Hepburn Committee Report, p. 3112.

²Record Proceedings Railroad Commission of Illinois in Revision of Maximum Freight Rates, 1905, pp. 32 and 88.

³ 55th Congress, 1st Session, Senate Document No. 39, p. 33. The Hepburn Committee (p. 3111) describes the local jealousies which prevailed.

⁴Chicago has never become reconciled to it, however, alleging that it injures her commercially. Compare Windom Committee, 1874, vol. i. p. 24; 51st Congress, 1st Session, Senate Report No. 847, 1890, pp. 611 *et seq.*; Elkins Committee, 1905, pp. 1433, 2538 *et seq.*; and Record Proceedings Illinois Railroad Commission on Revision of Maximum Rates, 1905. *Cf.* p. 209, *infra*.

territory along its line was so far from the lakes that it had little to fear from water competition at intermediate points between Chicago and the seaboard. Would it accept a plan primarily intended to meet a danger which, while injuring its powerful rivals, was of less consequence to itself? Fortunately for the scheme, it was based upon the solid principle that distance was of preponderating influence in the adjustment of rates. The entire contention of the Baltimore & Ohio and the Pennsylvania for a differential rate to Baltimore and Philadelphia below New York rested upon this same principle. The distance from Chicago to the southern ports was less. Consequently, they insisted, they were entitled to offer a lower rate. The McGraham scale and the port differentials were thus logically connected. They stood or fell together. The McGraham plan materially aided the Baltimore & Ohio in making good its demands.¹ It was acceptable, therefore, by reason of this collateral advantage.

Another factor in the situation appealed to the Pennsylvania and the Baltimore & Ohio. Their lines to tide water were about 75 and 100 miles shorter, respectively, than the shortest line to New York.² In the division of the joint through rate between a chain of connecting railway lines this was of great advantage. It always aids the shorter line, if pro-rating is based upon mileage. A feeder 100 miles long pro-rating with a trunk line 1,000 miles in length would be entitled to only one-eleventh of the total rate. Were the trunk line only 800 miles long, the neutral road might claim one-ninth. This seemingly slight difference might mean several hundred thousand dollars more earnings to the neutral road, or feeder, if it

¹ Hepburn Committee, p. 3104.

² Distances are given in the Thurman-Washburne-Cooley Advisory Commission on Differentials, etc., of 1882.

turned over its business to the short line.¹ Any emphasis upon distance as a general principle strengthened the Baltimore & Ohio in securing patronage from other roads by this means. The other trunk lines, through acceptance of the McGraham scale, conceded the distance principle, and with it, coincidently, the pro-rating practice.

After three years' experience the McGraham scale was readjusted to conform more closely to the cost-of-service principle. The plan, as thus revised, is the one still in force.² It recognizes that railway charges should be proportioned to the length of haul, so far as actual costs of hauling are concerned; but it first eliminates those constant elements in cost which do not vary with distance. The original McGraham scale made no such distinctions. The expenses at terminals, such as loading and unloading, are, of course, entirely independent of the distance covered by the shipment. These, being determined roughly by experimentation, are first deducted from an assumed Chicago rate. From the remainder the rate per mile by the shortest route to New York (920 miles) is then calculated by simple division. This rate per mile is then applied to the distance to any intermediate point, and the terminal charge is again added. Thus a rate is found which is reduced to a percentage of the original Chicago base rate.

¹ Hepburn Committee, pp. 3188, 3195.

² The revised table of percentages is reprinted in full in Hepburn Committee Report, p. 3107 *et seq.*

For Illustration.¹

	<i>Cents per 100 lbs.</i>
Chicago to New York	25
Less fixed charges on both ends of the line	6
<hr/>	
The basis of rate for computation being the remainder, or . .	19
Using short line mileage 920 miles, Chicago to New York, would yield a rate per mile	00.0206
Short line mileage Indianapolis to New York, 833 miles, yields a rate of	17.2
Plus six cents fixed charges, as above, makes	23.2
The percentage of New York rate being	93 per cent.
Which is the present percentage basis Indianapolis to New York.	
Short line mileage Frankfort, Indiana, to New York is 881 miles, which would yield at the rate of 00.0206 cents per mile	18
Plus terminal charges	6
<hr/>	
Which is 96 per cent. of 25 cents	24

¹ The official rule from Proceedings of the Joint Executive Committee, June 12 and 13, 1879, is as follows:—

“First.—That from all points being less distant from New York than Chicago new percentages be adopted for making up rates on east-bound freight upon the following basis: the percentages from points of the same, or no greater distance than Chicago, to continue as heretofore.

“Second.—That six cents per 100 pounds be first deducted from an assumed rate of 25 cents per 100 pounds, Chicago to New York, said deduction to represent the fixed charges at both ends of long or short hauls.

“Third.—That, after such deduction, the rate per mile, which the remainder, or 19 cents per 100 pounds, produces from Chicago to New York, shall be charged per mile from all common points named in the first section, according to the percentages of distance shown by the table adopted at Chicago, April 31, 1876, to which result so computed the 6 cents per 100 pounds of fixed charges first above deducted shall be again added, and the percentage of the Chicago rate of 25 cents, produced by such additions, shall thereafter constitute the percentage of the Chicago rate, which shall be subsequently charged from the points named in first section.

For Illustration.

Chicago to New York, per 100 lbs.	25c.
Less fixed charges, per 100 lbs.	6
<hr/>	
Basis of rate for computation	19c.
Columbus, Ohio, as at present 70 per cent. of Chicago net rate, will be . .	13.3c.
To which add the fixed charges	6
<hr/>	
	19.3c.

And the new percentage from Columbus will hereafter be $77\frac{2}{3}$ per cent. of Chicago, in lieu of 70 per cent., as at present.”

The revised system provides in theory for an absolutely constant rate per ton mile. It is a rigid mileage tariff in every respect. The original McGraham scale had been so in theory, but not in practice. As amended in conformity with a sound economic principle, it had, moreover, one important practical advantage over the original scale. It yielded more revenue at all the intermediate points.¹ Local rates would be higher as thus calculated than they were originally. It would be unjust to ascribe undue importance to this motive on the part of the roads in the adoption of the new system. That the plan yielded additional revenue, while obviously more just in theory, was naturally no objection to its acceptance.

The fruits of all this process of adjustment are depicted upon the accompanying diagram. Viewing it in a large way, and reserving details for later consideration, we may compare it to a topographical contour map. The several rate zones are thus analogous to a series of levels or steps rising from east to west. Our cross section of these along a line from Pittsburg to Burlington, Iowa, makes this relation plain. Another cross section at right angles to the first from Louisville, Kentucky, to Lansing, Michigan and beyond, shows how these levels are arranged in a plane from north to south. These steps form a sort of irregular ampitheatre opening toward the east, with its main axis lying in a direction slightly south of west toward St. Louis. Or, more correctly, these rate zones, pursuing our analogy to a topographical contour map, indicate a broad valley opening toward the east. Along the bottom of this freight-rate valley lie the great direct trunk lines converging from Chicago and St. Louis. Throughout the State of Illinois

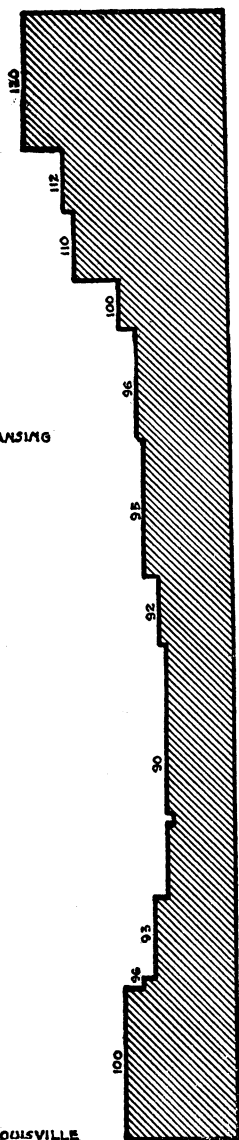
¹ Hepburn Committee, p. 3104. A hypothetical instance will serve as illustration. Suppose a point with an 80 per cent. rate on the old schedule. When Chicago paid 25 cents, the rate to this point would be 20 cents. Under the new scheme the intermediate rate would be 80 per cent. of 19 cents, or 15.2 cents, plus 6 cents terminal charge, making a total of 21.2 cents. This is 84.8 per cent. of the Chicago rate instead of 80 per cent. as before. Compare table, p. 203, *infra*.

the valley opens up onto a plateau, somewhat grooved in the middle at Peoria, where the direct lines from the west cross a neutral field tributary neither to Chicago nor St. Louis exclusively. This general description harmonizes with the apt figure used by that master mind in railway economics, Albert Fink. Speaking of this situation, he says, "The trunk lines are nothing but great arteries of commerce, like rivers, only with this difference: the rivers never run across each other, the territory from which they draw their supplies is distinct and well defined." Since his time, by reason of co-operative action for a generation, the confusing maze of railway lines has now been reduced to a single comprehensive system. Cross-currents of trade hither and thither have been united or articulated in such a way as, speaking in terms of freight charges, to cause the great internal commerce of the country to flow downhill toward the seaboard in an orderly and reasonable way. The inequalities incident to commercial competition have been modified, or, to revert to our original figure, eroded; so that one may literally speak of the products of the country as flowing, like rivers, in more or less natural channels over the railway lines from the great interior basin towards the Atlantic seaboard.

The mathematical precision of the method of computation heretofore described, while theoretically applicable to a series of parallel roads in a flat country, free from either water competition, the competition of cross railway lines, or the competition of towns and cities of unequal size and importance, obviously requires modification to suit the actual traffic conditions in this densely populated trunk line territory. The process of adjustment has been gradual and necessarily tentative. Every influence brought to bear has been subversive of systematic arrangement, tending, that is to say, to amend the scheme out of all semblance to mathematical order. After reading

LOUISVILLE

LANSING

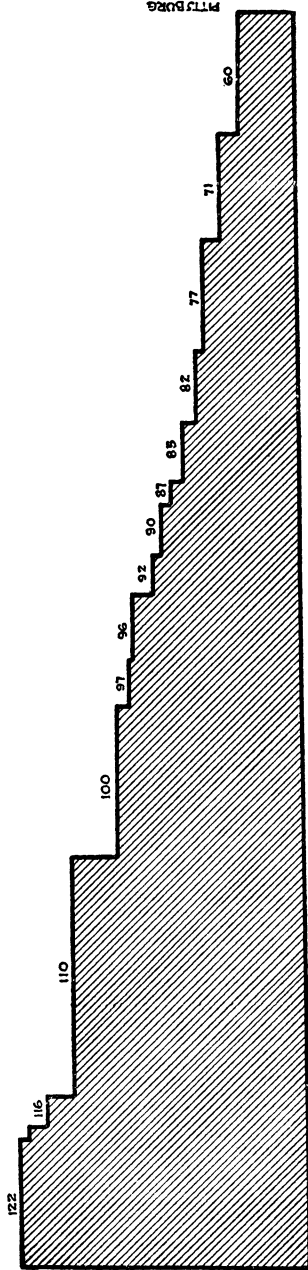


CROSS-SECTION THROUGH LOUISVILLE AND LANSING

122

BURLINGTON

PITTSBURG



CROSS-SECTION FROM BURLINGTON TO PITTSBURG

volumes of the Proceedings of the Joint Rate Committee, filled with petitions of railways, towns, and individuals for exception to the general rules, one is surprised to find that, after all, the scheme is so well ordered as it is. It has been held true only by rigid adherence to the rule that by the shortest "workable and worked route" no intermediate place shall be charged more than is charged to any point beyond. In other words, the long and short haul principle is consistently observed. Space does not permit a discussion of all of the factors which have tended to modify the original simple scheme. Three alone may be considered as illustrative of the rest. These are: (1) the effect of railway competition at the important junction points; (2) the influence of the independent cross lines of railway; and (3) commercial competition between producing or distributing centres.

The effect of railway competition at junction points is revealed at once, upon inspection of the map, by the general law that the boundary line of zones lies immediately west of the large cities. Notice the location of Cleveland, Warren, Pennsylvania; Newark, Ohio; Dayton, Fort Wayne, Detroit, Port Huron, Cincinnati, Indianapolis, Louisville, Lansing, Logansport, Terre Haute, Peoria, and Decatur. Columbus, Toledo, and Evansville, Indiana, are about the only exceptions. In nearly every case the theoretical zone boundary has been shifted in such a way that the rate rises just west of the important competitive point. The reason is obvious. Rates being held down at these points, and no greater rate being possible at any other point further east, conditions must be equalized *upwards*, immediately the depressing influence of competition is removed. Each zone level is of necessity an average of a theoretic constantly rising scale from east to west. Places immediately west of an important junction point are raised somewhat above their theoretical grade

as a compensation for those places on the westerly side of each zone whose rate is held down below their theoretical level by the exigency of competition at the next large town. Or, to be specific, Indianapolis may hold down the rate to 93 per cent. of the Chicago rate farther west than otherwise would be the case. In fact, by reason of its paramount importance as a railway centre, it has held down the rate so far west that for purposes of equalization the rate west of it immediately jumps to 100 per cent. For, as will be observed, on inspection of the map, the 96-97 per cent. zone is interrupted at this point; the 92-95 per cent. zone being extended unduly far west and the 100 per cent. zone being extended inordinately far east, until the two meet just west of Indianapolis. Detailed study of the schedules and maps will reveal many similar instances.

The converse of the proposition that important junction points lie near the western zone boundaries is found in the fact that, where competition is absent, the zones sweep much farther east than mathematically would be prescribed. In other words, wherever competition is less keen, the percentage rates remain high. Were competition entirely uniform in its geographical distribution, the several zones would be parallel, sweeping evenly clear across the map. Illustration of this circumstance will be found in the extension of the 87 per cent. zone far to the east, along the Ohio River, in fact nearly to Parkersburg, West Virginia. Or, again, in the 110 per cent. territory which extends nearly to Louisville. This latter rate has been recently amended, as will be shown later; but for many years continued, as here represented, abnormally far to the east. In both these instances the railway facilities along the river are monopolized by the Baltimore & Ohio as a trunk line. The only competition is due to the Cincinnati, Hamilton & Dayton and Norfolk & Western,

both of which work their traffic from New York north. The population and traffic density being at the same time low, a relatively high level of rates has resulted. Sometimes, also, it may happen that in these outlying regions the shortest line "workable and worked" to the seaboard may not be due east, but may proceed north until a junction with a trunk line can be effected.¹

The influence of independent transverse lines of railway has been of great importance in shifting the zone boundaries from their theoretical location to conform to practical requirements. Study of the map permits a second important generalization. Not only does the boundary of the zones usually lie just west of large cities, the course of the boundary at the same time frequently follows the location of important independent transverse railways. The zone boundary, in other words, lies just west of the cross railway line. For example, the western boundary of the 100 per cent. Chicago zone, after leaving a point on the Illinois Central, is defined from north to south by the course of the Chicago & Eastern Illinois Railroad, and below Terre Haute by the line of the Terre Haute & Evansville. Similarly, practical exigencies determined the odd shape of the 110 per cent. zone, formed like a great distorted boot leg. The western boundary of this 110 per cent. zone from Peoria south closely follows the Peoria, Decatur & Evansville road nearly to the Ohio River. Similarly conditioned by railway lines are the boundaries north and south of Indianapolis, and especially north and south of Fort Wayne, Indiana. In other cases where the transverse lines do not cross nearly at right angles with the trunk line, the zone boundary will follow one railway for some distance, and then skip across to another railway

¹Thus from Ironton, in the 87 per cent. zone south of Columbus, Ohio, the distance to Columbus is 127 miles, added to 638 miles from Columbus to New York makes a total of 765 miles. Multiplying this by 00.0206 makes it 87 per cent. of the Chicago rate.

whose general direction is more nearly perpendicular to the trunk lines. Thus, from Toledo to Lima, Ohio, the western boundary of the 76-80 per cent. zone follows the Cincinnati, Hamilton & Dayton, cutting the Baltimore & Ohio and Pennsylvania trunk lines at right angles; and then it jumps across to the east until it strikes the sweep of the Toledo & Ohio Central, which carries it down almost to Columbus. Similarly, the western boundary of the 66½ per cent. zone follows the line of the Pittsburgh & Western north from Warren, in order that that line may participate in New York business by working its line north via Painesville on the Lake Shore.

Why is it apparently necessary that these zone boundaries should follow along just west of the cross railway lines? The reason may be made clear by a concrete instance. Originally and until about 1891, Louisville, Kentucky, instead of having the 100 per cent. Chicago rate, as at present, enjoyed, on the base of its distance from New York, about 96 or 97 per cent. of the Chicago rate. In other words, the 96-97 per cent. zone shown on our map as interrupted at Indianapolis, partly for reasons already mentioned, originally swept across the map all the way from Grand Rapids to the Ohio River. This territory from Chicago south is served by the Monon Railway (Chicago, Indianapolis & Louisville), whose line, not fully indicated on the map, thus lay partly in 100 per cent., partly in 96 per cent., and partly in 97 per cent. territory. An important part of the traffic of the Monon, as well as of the other independent north and south lines, consists of business coming in from the East at the north and worked south, or coming in from the East at the south and worked north. Or, in other words, this line subsisted in part upon indirectly routed tonnage from New York, let us say, destined for Louisville, but reaching it by way of Chicago junction points. Freight thus hauled around two sides of

a triangle, instead of by a direct line, constitutes one of the important sources of waste of transportation energy to be described in another paper. The Monon by such tactics is able to participate in, and to profit by, a much larger volume through business. That is to say, its proportion of the entire haul is much greater than it would be if the business moved by the shortest line. Moreover, when indirectly routed, the Monon, often securing for its trunk line connections tonnage for the East which would naturally go to other competitive trunk lines, is able to exact a higher pro-rating than even its extended lateral haul would justify on a strictly distance basis. Such circumstances always greatly enhance the profitableness of lateral hauls to minor connecting roads. It is obvious that much of this transverse haulage would be impossible wherever the lateral railway lines traverse different zones of rates. It might haul traffic from its 100 per cent. end, to connect at its 96 per cent. end with a trunk line for the East, but not in the opposite direction. The Monon, always in a position to disturb the rate situation, through connection with all the competing trunk lines, insisted upon equality of rates all along its line. To do this, the 100 per cent. zone had to be extended east to Indianapolis. Thereafter the Monon could profitably "work its line in both directions." This illustration will serve to show why ordinarily the zone boundaries conform as closely as possible to the course of the lateral roads. The confusion which would be engendered, were the Peoria, Decatur & Evansville to be partly in the 110 per cent. and partly in higher percentage territory, while still insisting upon its right to work its line both ways, can readily be imagined. To avoid such difficulties, the present modification of strictly distance percentages had to be adopted.

The third dominant influence, above mentioned, in modifying the mathematical precision of percentages based

alone upon the distance from New York, has been the commercial competition of traders and cities one with another. The aim of all rate adjustment should be, and in fact, so far as possible in American railway practice, is to equalize conditions, so that the widest possible market shall result. Producers or traders in each city demand access on even terms to all territory naturally tributary to them by reason of their geographical location. Each particular railroad sees to it that its own patrons and cities are "held" in all parts of these markets, as against the efforts of competing railways to promote the welfare of their own constituencies. Consequently, the Proceedings of the Joint Rate Committee are filled with discussions as to the advisability of amending general rules here and there to suit local conditions. Minor changes are continually being effected. Grand Rapids, Michigan, once in 100 per cent. territory, asked for a 90 per cent. rate, and in 1891 secured a reduction to 96 per cent.¹ Louisville, once in 97 per cent. territory, is now a 100 per cent. point. Shifts in both directions have frequently occurred, as the following table of percentages shows:²—

<i>Basis.</i>	<i>Detroit.</i>	<i>Toledo.</i>	<i>Sandusky.</i>	<i>Cleveland.</i>
April 13, 1876	85	78	71	65
June 23, 1879 ³	81.5	81.5	78	73.5
April 14, 1880	75.5 ⁴	75.5	75.5	70
Present (1900)	78	78	78	71

A number of changes were made in 1887 in order to conform to the long and short haul clause. Flint, Michigan, for example, was reduced from 95 to 92 per cent.; Ash-tabula, Ohio, from 71 to 67; while Springfield, Ohio, was

¹ Cf. Industrial Commission, vol. iv. p. 556.

² Record, Detroit Board of Trade case.

³ Consult p. 195, *supra*.

⁴ Computed apparently by regular rules, but on the basis of only 4 cents terminal charges instead of the usual 6.

raised from 82 to 83 per cent.¹ Detroit has been most active in prosecuting its claims for a reduced percentage.² But the Interstate Commerce Commission in 1888 upheld the present status. A recent minor change is indicative of the forces which must be dealt with. Evansville, Indiana, on the Ohio River, according to our map, is a 110 per cent. point. Vincennes, Indiana, lies just north of it in the 108 per cent. triangular zone. Since this plate was made, Evansville has been reduced to 105 and Vincennes to 103 per cent., respectively. This is substantially, I am told, on a mileage basis. The reason for the amendment is that certain important industries are located at these points. Either to favor them specially or to remove a pre-existing disability in competition with other towns, this change was insisted upon by the railways interested in their prosperity. By tentative processes of adjustment like this the present general relations have been established. They have been kept constant only by the steady resistance of the majority of carriers to action which is in the interest of a few. Judged by results, it would appear that the broad view has, in the main, prevailed.

The actual situation resulting from the above-named causes, it should be observed, is not quite as simple as our map makes it appear. Most of the zones are in fact subdivided into minor gradations. Thus the closely dotted zone designated "86-90 incl." is constituted of an 87 per cent. area up as far as the railway from Dayton to Indianapolis; while the rest of it is broken up into little 88, 89, and 90 per cent. areas, respectively. The same thing occurs elsewhere. Our map generalizes the results, in an effort to bring out the zone relationships as fully as is technically possible in a single diagram. Certain of

¹ Joint Rate Circular, No. 815.

² Demanding a 70 per cent. rate on a strict mileage basis, and also because the pro-rating basis with Western lines is at that figure.

the zones, however, such as the 60, 66½, 100, and 110 per cent. territories, are bounded exactly as here represented.

As for direction, the original scale was intended only for east-bound traffic. West-bound rates were lower and more irregular. But the system worked so well that it was soon extended to cover the west-bound business. Owing to difficulties of routing, in order to transport by the shortest line into Chicago, these west-bound percentages were often quite different from those in the opposite direction.¹ Detroit, for instance, for some time prior to 1886 enjoyed a 70 per cent. rate west-bound, while its percentage in the opposite direction was 78.² But, after the passage of the Act to Regulate Commerce in 1887, efforts were made to harmonize the differences.³ At the present time the rates east and west are in most cases the same.

At this point it is essential to understand the limitations within which this percentage system is confined. It does not necessarily determine the exact rate to be applied in practice from every little station in trunk line territory. For, in the first place, it concerns only the so-called common points; that is to say, points where competition of two or more carriers is effective. Purely local stations are charged an "arbitrary" into the nearest common point. But, inasmuch as throughout this much be-railroaded country most shippers are less than twenty miles from the next line,⁴ and since, moreover, the arbitrary can never raise the local rate above the rate to the next common point

¹ Trunk Line Association Circular No. 523, issued July 26, 1883, gives tables of these percentages in each direction. Present west-bound percentages are given in *Ibid.*, No. 751, issued April 3, 1899.

² Typewritten record, Detroit Board of Trade case, 1887-88, Interstate Commerce Commission Office, pp. 244-251.

³ Under a committee headed by the late J. T. R. McKay, of Cleveland. The Official Classification and the 75 cent New York-Chicago rate first-class were then adopted for good.

⁴ I am told that rivers intervening to cut off cartage by wagon to competing lines have sometimes effectively influenced the charges.

beyond,¹ the scale is practically effective everywhere. A more important consideration is the fact that this scale, even for common points, does not positively fix the rate. It merely provides a minimum below which rates shall not be reduced, except by authority of the roads acting jointly. It is a minimum, not a maximum, schedule in every sense. Its provisions are never promulgated in the form of tariffs as such. They are rarely known to shippers, but serve only as a guide to traffic officials. The Interstate Commerce Commission, in sanctioning the system, has expressly recognized this fact.² Moreover, these percentage rates apply to "classified" tonnage, and not to the great bulk of commodity or special rates which are independently made. This exception is more important than either of the others, inasmuch as probably three-fourths at least, of the trunk line tonnage measured by weight, is moved under such commodity rates. Financially, of course, the relative proportion of commodity freight is vastly less than this figure. For the classified tonnage is made up exclusively of high-grade goods, transported at most remunerative rates, while the commodity traffic, while bulky, often yields a very low revenue per ton mile.

Other exceptions to the applicability of this percentage system deserve mention, although they are of relative unimportance. Principal among these is the confusion engendered in Illinois territory through the entry of the Western lines into Chicago. Throughout their constituencies, by reason of the sparse population, freedom from competition, inequality of east and west bound tonnage, and low-grade freight, Western railroad rates per ton mile

¹ The long and short haul principle has always been given great weight here. All exceptions to it were removed in good faith by the carriers when the Act of 1887 was passed. Cf. Windom Committee, vol. i. p. 26; vol. iii. pp. 42, 134, and 283.

² *G. C. Pratt Lumber Co. v. Chicago, Ind. & Louisville Ry. Co.*, decided January 27, 1904.

are very much higher than on the trunk lines. Moreover, they are naturally desirous of as long a haul as possible, namely into Chicago. To turn over their local Illinois traffic to the trunk line feeders exposes them financially to the same losses as those above mentioned in the case of lateral independent lines further east. But these Western lines, being stronger, have insisted upon recognition of their claims to a proportion of the through rate which would at least "pay for their axle grease."¹ The result is that throughout Illinois, especially in the north and toward the Mississippi, the distance principle is considerably distorted, as our map clearly shows.—The percentage system practically excludes freight "From Beyond," the rates on that being determined by other rules.

East of the Central Traffic Association territory shown on our map the same percentage system is extended to points in New York and Pennsylvania.² Suppose, for example, the rate were desired from Columbus, Ohio, to Albany, New York, or any other point between Buffalo and New York City. The rate from Columbus to New York City would first be determined as a percentage of the Chicago-New York rate, under the system already described. Then from Columbus to Albany the rate would be prescribed as a new percentage of this percentage. The initial Western points, however, are not determined individually, but are comprehended in large groups. Thus the rate from all points in the 72-78 per cent. territory, shown on our map, to Albany, New York, is 96 per cent. of what the rate would be from those points to New York City. Syracuse has 76 and Utica 87 per cent., respectively, of the rate from any point in this 72-78 per cent. territory. From points beyond Chicago taking, that is to say, more

¹ United States Industrial Commission, vol. iv. p. 562.

² Cf. Joint Committee Information No. 298 of January 13, 1900, giving all these rules in detail.

than 100 per cent. of the New York-Chicago rate, the percentages of the rate to New York City applying to Albany, Syracuse, and Utica are correspondingly modified to 96, 84, and 91, respectively. Other complications, such as the addition of arbitraries to Boston and New England points or the subtraction of differentials to Baltimore and Philadelphia, follow. But, in the main, conforming always to the long and short haul principle,¹ rates to all local stations are prescribed within narrow limits by means of a small number of these fixed points. The system is the same, although details may vary. Everything interlocks and is harmoniously related on the distance basis.

Rates from one point to another within the Central Traffic Association territory shown on our map now alone remain for consideration. These cannot, of course, be adjusted on a percentage basis, inasmuch as such traffic may not be east or west bound at all, but may consist of shipments in any direction. There is no logical reason why they should interlock with east or west bound through rates when the traffic is, perhaps, moving locally north and south. Nevertheless, the long and short haul principle is observed with the same fidelity. A rigid distance tariff for short hauls, the limits of which are prescribed by the rates for long hauls under the McGraham schedule, prevails.² For distances up to 75 miles this conforms closely to the rates originally prescribed by the Ohio legislature. For greater distances it is much lower than the Ohio tariff.³ Thus the Ohio rate for 350 miles is 87.5 cents, while the C. F. A. (Central Freight Association) scale is only 42 cents. The Ohio scale for 200 miles is 50 cents, the C. F. A. rate for the same distance is only

¹ Cf. Windom Committee, vol. ii. pp. 42 and 134.

² Known as the C. F. A. scale. Full text is printed in Illinois Railroad Commission Proceedings in Maximum Freight Rate Case, Record, etc., 1905, p. 43. See also p. 97.

³ Detailed comparison is made in *Ibid.*, p. 45. See also p. 172.

33 cents. Thus it appears that this C. F. A. tariff, applicable to interstate business and beyond control of any State legislature, has, in reality, been voluntarily adopted by the interested railroads. The tariff is only a minimum scale, below which the roads agree not to reduce rates, and above which the actual rates often rise.¹ Nevertheless, the fact remains that these rates, according to distance, are so much lower than the Illinois Railroad Commission's tariff that Chicago and other distributing centres throughout the State of Illinois claim that it works great hardship to them. The situation in Illinois is geographically peculiar. Its great commercial centre is in the extreme northeastern corner, while, at the same time, the greatest extension of the State is north and south. These circumstances, coupled with an interstate (C. F. A.) tariff lower than the Illinois official tariff under which Chicago merchants must ship out their goods, enable Detroit, Indianapolis, and Cincinnati to undersell Chicago in its own State. Chicago can be equalized there only by special or secret rates.² Other local centres, like Quincy, Illinois, joined with Chicago in this complaint to the Illinois Railroad Commission that their rates were too high.³ Think of it! Shippers complaining that a government rate was too high, and requesting that the railway tariff (C. F. A. schedule) be adopted in its place! Is that not evidence that reasonable treatment of its shippers by railway companies is appreciated by the public? Without undue extension further details of this interesting controversy cannot be given. It will suffice to state that in December, 1905, the Illinois Railroad Commission ordered a reduction of its official schedule by 20 per cent., in an attempt to

¹ Illinois Railroad Commission Proceedings in Maximum Freight Rate Case, Record, etc., 1905, p. 152.

² Exhibit A 15, *Ibid.*, shows this by means of a map. See also Elkins Committee, vol. iii. p. 2271.

³ The double disability of these smaller places is stated in *Ibid.*, p. 7.

reduce its rates to conform more nearly to the C. F. A. railway tariff.

The evils incident upon two conflicting governmental authorities, State and Federal, each attempting to regulate rates independently, are clearly indicated in the preceding paragraph. The Interstate Commerce Commission has been brought flatly up against them in one of its recent Texas cases. Local and interstate rates must inevitably be adjusted with reference to one another, so complex are the conditions of commercial competition. So long as the plain people remain unsatisfied that any real Federal regulative power exists, is it not possible that the number of arbitrary State tariffs, like those of Illinois and, more recently, of Missouri will tend to increase? If State legislative attention could be diverted from similar activities, and such control as circumstances seem to warrant were to proceed from an efficient, centralized Federal source, the business of railway transportation might be more easily conducted than under present chaotic conditions. Regulation at best is a most difficult and delicate matter. It should never be attempted lightly. The main activities of any governmental commission should be directed towards settlements out of court, with as little exercise of mandatory power as possible. The chances seem to me to be more than even that a broad-gauge Federal commission would accomplish its ends in this manner, and thus tend to discourage State legislative interference in future.

WILLIAM Z. RIPLEY.